IN THE CLAIMS:

1. (Withdrawn) A method of fabricating an advanced valve metal (AVM) anode, comprising the steps of:

a) depositing a metallic powder in a receiving container;

b) applying pressure to the metallic powder to form a pressed, raw anode slug having a common press-density;

c) retrieving the pressed, raw anode slug from the receiving container;

d) removing at least one portion of material from a surface or an interior region of the pressed, raw anode slug;

e) sintering the pressed, raw anode slug to produce a sintered anode;

f) placing the sintered anode in an electrolyte solution; and

g) applying electrical potential to the sintered.

2. (Withdrawn) A method according to claim 1, further comprising the step of forming surface features in the pressed, raw anode by performing at least one of the following:

forming at least one surface feature in at least a portion of a major surface of the container;

mechanically removing additional material from the pressed, raw anode;

chemically etching the pressed, raw anode.

3. (Withdrawn) A method according to claim 2, further comprising the step of inserting a cathode member at least partially into at least one of the surface features.

4. (Withdrawn) A method according to claim 3, wherein the cathode member is an elongated member having a core, a high capacitance coating surrounding the core, and an electrically insulative layer surrounding the high capacitance coating.

5. (Withdrawn) A method according to claim 4, wherein the high capacitance coating is one of the following: a carbon layer, a carbide layer, a carbonaceous layer, a

metal oxide coating, a ruthenium oxide coating, a niobium oxide coating, a tantalum pentoxide coating; and wherein the outer, electrically insulative layer is a one of the following: a polymeric layer, a resin-based layer, a PTFE layer, a ePTFE layer.

6. (Withdrawn) A method according to claim 1, wherein the removed portions of the pressed, raw anode comprise a pattern of apertures formed in the pressed, raw anode.

7. (Withdrawn) A method according to claim 1, wherein the removed portions of the pressed, raw anode comprise a pattern of bores formed in the pressed, raw anode.

8. (Withdrawn) A method according to claim 1, wherein the removed portions of pressed, raw anode comprise a pattern of apertures formed in a lateral side area of the pressed, raw anode.

9. (Withdrawn) A method according to claim 1, wherein the metallic powder includes a grain index between about 10,000 and about 100,000.

10. (Withdrawn) A method according to claim 1, wherein approximately five percent of the pressed, raw anode is removed during said removal step.

11. (Withdrawn) A method according to claim 1, wherein the depositing step a) further comprises:
a1) depositing a layer of a metallic powder having a second grain dimension which is different from said common grain dimension.

12. (Withdrawn) A method according to claim 11, wherein said common and said second grain dimension results from a granular material added to said metallic powder.

13. (Withdrawn) A method according to claim 12, wherein said granular material comprises a material that is readily removable from the pressed, raw anode, and further comprising. following removal of portions of the pressed, raw anode:
d1) applying thermal energy; or
d2) immersing said pressed, raw anode in a solvent,
sufficient to substantially remove said material from said pressed, raw anode.

14. (Withdrawn) A method according to claim 12, wherein said granular material includes a removable material and further comprising a step d1) wherein following removal of portions of the raw anode, applying an amount of fluid sufficient to substantially remove said material from said raw anode.

15-27 (Cancelled)

28. (Previously Presented) A method according to claim 1, wherein the subjecting step further comprises delivering the potential pulses to the anode-electrolyte system for a predetermined hold time after achievement of the target formation voltage until the current flow through the anode-electrolyte system has dropped to a predetermined level.

29. (Previously Presented) A method according to claim 28, further comprising the step of agitating the electrolyte in the time between delivered potential pulses.

30. (Previously Presented) A method according to claim 29, wherein the agitating step comprises subjecting the electrolyte to sound energy at a frequency in the range from ultrasonic frequencies to audible frequencies.

31. (Previously Presented) A method according to claim 1, wherein the subjecting step further comprises:

delivering the potential and current pulses having pulse amplitudes and pulse widths to the anode-electrolyte system; and

decreasing the peak height of the current pulses as the potential pulse amplitude approaches the target formation potential.

32. (Previously Presented) A high energy-density valve metal anode, comprising:

a multi-density, layered porous sintered valve metal anode member having a layer of oxide formed on exposed surfaces of the anode member and wherein said valve metal anode has a cross-sectional density profile wherein an outmost layer that is less dense than the density of a central layer of the valve metal anode; and

a conductive lead wire coupled to the anode member.

33. (Previously Presented) An anode according to claim 32, wherein said central layer has a pair of opposing major planar surfaces and said outermost layer surrounds said central layer so that a portion of the outermost layer abuts the pair of opposing major planar surfaces of the central layer.

34. (Previously Presented) An anode according to claim 33, wherein said central layer comprises a pressed and sintered layer of metallic material and said outermost layer comprises a perforated structure.

35. (Previously Presented) An anode according to claim 34, wherein the outermost layer is configured so that for substantially each surface location of said central layer a shortest transport path distance exists with respect to the closest exterior surface location of the outermost layer.

36. (Previously Presented) An anode according to claim 34, wherein the outermost layer has a substantially planar configuration having a minor thickness dimension approximately equal to the average transport path for each surface location of said central layer.

37. (Previously Presented) An anode according to claim 32, further comprising an intermediate layer interposed between the central layer and the outermost layer and having a density higher than the density of the central layer and lower than the outermost layer.

38. (Previously Presented) An anode according to claim 37, wherein said intermediate layer and said outermost layer are perforated with a plurality of passageways and a majority of said passageways fluidly couple opposing major surfaces of said intermediate layer and said outermost layer.

39. (Previously Presented) An anode according to claim 38, wherein said majority of passageways continuously fluidly couple an exterior surface of said outermost layer to said central layer.

40. (Previously Presented) An anode member for a high energy density capacitor apparatus, comprising:
a porous sintered valve metal anode member assembly having a central layer, a first layer substantially surrounding said central layer, and a second layer substantially surrounding said first layer, wherein the central layer comprises a high density member, the first layer comprises a lower density member, and said second layer comprises a lowest density member and wherein said central, said first and said second layer are independently pressed and sintered, and then combined and anodized together in a formation electrolyte solution so that a layer of oxide is formed on exposed surfaces of each of said central, said first, and said second layers; and
a conductive lead wire coupled to a portion of said anode member.

41. (Previously Presented) An anode member according to claim 39, wherein said central layer, said first layer and said second layer include a plurality of apertures formed therein adapted for receiving a plurality of elongated cathode members arranged

in an array and wherein the interior of said plurality of apertures are covered with an electrically non-conductive material so that when said elongated cathode members are inserted therein said anode member and said plurality of elongated cathode members are not in direct electrical communication.

42. (Previously Presented) An anode member according to claim 40, further comprising a relatively different density material disposed in at least one of the plurality of apertures.

43. (Previously Presented) An anode member according to claim 41, wherein the relatively different density material comprises one of: a cellulose material, a metallic powder, a non-woven material.

44. (Previously Presented) A method according to claim 2, wherein the step of forming surface features in at least a portion of the major lower surface of the container, comprises:

forming one of a substantially convex and a substantially concave surface feature.

45. (Previously Presented) A capacitor apparatus, comprising:

a porous sintered valve metal anode member having at least two cavities formed therein;

a conductive lead wire coupled to the anode member;

at least one cathode member disposed in electrical communication with said anode member; and

a housing means for retaining the anode member and cathode member,

wherein said valve metal anode includes a cross-sectional density gradient and a peripheral portion of the valve metal anode is relatively less dense than a central portion of the valve metal anode.

46. (Original) A capacitor apparatus according to claim 45, wherein the central portion comprises a substantially uniform shape.

47. (Original) A capacitor apparatus according to claim 45, wherein the peripheral portion includes at least one elongated hollow passageway.

48. (Previously Presented) A capacitor apparatus according to claim 47, wherein the at least one elongated hollow passageway is occupied by a material.

49. (Previously Presented) A capacitor apparatus according to claim 48, wherein the material is one of: a material that absorbs liquid electrolyte, a cellulose-based material, a cathode material, a non-woven material, a metallic powder of different density than the density of the peripheral portion.

50. (Original) A capacitor apparatus according to claim 49, wherein the metallic powder has a different density than the density of the central portion.

51. (Previously Presented) A method according to claim 1, wherein said metallic powder comprises a material having a substantially common grain dimension and wherein said receiving container having a major lower surface opposing an upper opening.

52. (Previously Presented) A capacitor apparatus comprising:

a porous sintered valve metal anode member having at least two cavities formed therein;

a conductive lead wire coupled to the anode member;

at least one cathode member disposed in electrical communication with said anode member; and

a housing means for retaining the anode member and cathode member,

wherein the cathode member includes one of: a carbon material, stainless steel material, a carbide material, a titanium material and a ruthenium material.

53. (Previously Presented) An apparatus according to claim 52, wherein the anode member includes one of: an aluminum material, a tantalum material, a niobium material, a valve metal material, and an alloy comprising at least one valve metal.

54. (Previously Presented) An apparatus according to claim 52, wherein the at least two cavities comprises at least one surface feature on the anode member and said at least one surface feature comprises one of: a ridge, a boss, a channel, a tunnel, a corrugation, a ripple, a groove, a notch, a slot, a furrow, and a crease.

55. (Previously Presented) A capacitor apparatus, comprising:

a porous sintered valve metal anode member having at least two cavities formed therein;

a conductive lead wire coupled to the anode member;

at least one cathode member disposed in electrical communication with said anode member; and

a housing means for retaining the anode member and cathode member,

wherein said cathode member comprises an elongated cathode member and said elongated cathode member is at least partially inserted into one of said at least two cavities, and wherein said cathode member has a core surrounded by a high capacitance material and a separator layer surrounding the high capacitance material

56. (Previously Presented) An apparatus according to claim 55, wherein the at least one elongated cathode member further comprises a coaxial, nested set of hollow core members, and wherein said core members have a layer of one of the following disposed thereon: a carbon, a carbide, a metal oxide.

57. (Previously Presented) A capacitor apparatus, comprising:

a porous sintered valve metal anode member having at least two cavities formed therein;

a conductive lead wire coupled to the anode member;

at least one cathode member disposed in electrical communication with said anode member; and

a housing means for retaining the anode member and cathode member,

wherein said anode member and said cathode member each have major surfaces and the major surface of the anode member is disposed substantially orthogonal to the major surface of the cathode member.

58. (Previously Presented) An apparatus according to claim 57, further comprising:
a pair of cathode members disposed spaced apart so that the major surfaces of the pair of cathode members are substantially parallel; and
a plurality of anode members disposed between the pair of cathode members and electrically insulated from each adjacent one of said plurality of anode members.

59. (Previously Presented) An apparatus according to claim 57, wherein at least one of said plurality of anode members has a plurality of apertures formed therein.

60. (Previously Presented) An apparatus according to claim 59, further comprising at least one layer of porous material disposed between an adjacent pair of anode members.

61. (Currently Amended) An apparatus according to claim [[24]]<u>60</u>, wherein said at least one layer of porous material is an aluminum foil having a lower capacitance value than the anode members.

62. (Previously Presented) An apparatus according to claim 61, wherein the aluminum foil is mechanically etched with tunnel features oriented substantially parallel to the major surface or substantially orthogonal to the major surface.

63. (Previously Presented) An apparatus according to claim 62, wherein the aluminum foil is a relatively thick foil.

64. (Currently Amended) An apparatus according to claim 52, wherein said cathode member includes a coat of at least one of: a carbon layer, a carbide material, a carbonaceous material, a ruthenium oxide, an iron oxide, a nickel oxide, a titanium oxide, a ruthenium carbide, an iron carbide, and a nickel carbide.